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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Reissue Application of: Murali Rajagopalan

Serial No.: To Be Assigned

Filed: Of Even Date

For: Reissue of U.S. Patent 5,691,066

Group Art Unit:

Issued: November 25, 1997

Examiner:

For: GOLF BALL COMPRISING
FLUOROPOLYMER AND METHOD OF
MAKING SAME

Attorney Docket No.: 174-863

PRELIMINARY AMENDMENT

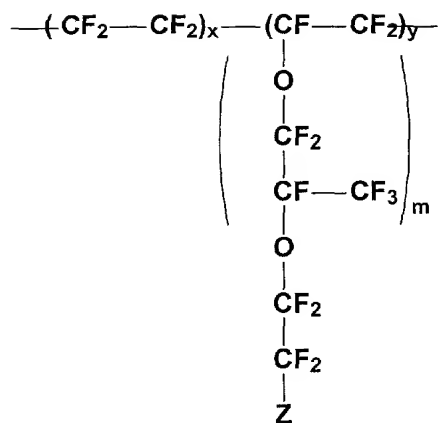
Assistant Commissioner for Patents
BOX PATENT APPLICATION
Washington, D.C. 20231

Sir:

Applicants request consideration and entry of the following amendments and remarks into the file of the above-identified reissue application prior to the examination thereof. Applicants submit herewith (a) a Reissue Declaration and Power of Attorney; (b) an Offer to Surrender Patent; (c) Consent by the Assignee for Filing of Reissue Application; (d) a Certificate under 37 C.F.R. § 3.73(b); (e) a copy of the original patent, in double column format; (f) Revised Form PTO- 1449; (g) a Reissue Information Disclosure Statement pursuant to 37 C.F.R. § 1.56, with references, and a Fee Transmittal Sheet (in duplicate).

In the Specification:

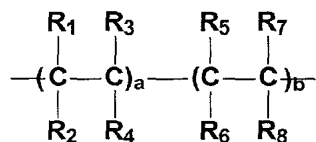
Please amend the formula at col. 7, lines 1-14 as follows:



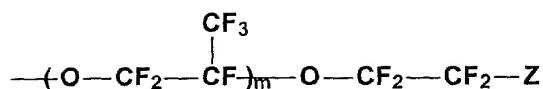
In the Claims:

Please amend the claims as follows:

1. (Amended) A golf ball having [an outer surface] a cover layer wherein the improvement comprises forming at least said [outer surface] cover layer of a thermoplastic material comprising at least one functionalized fluoropolymer, wherein said fluoropolymer has the formula



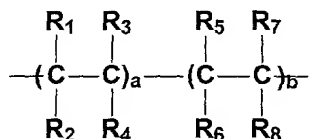
in which a is a number from 1 to 100; b is a number from 99 to 1; R₁-R₇ are independently selected from the group consisting of H, F, alkyl, and aryl; wherein at least one of R₁-R₇ is F; and R₈ is [H, F, or] a moiety of the formula



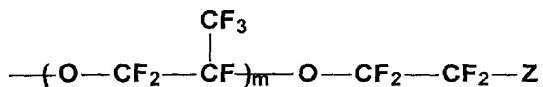
in which m is a number from 1 to 100; and Z is selected from the group consisting of SO₂F, SO₃H, SO₃⁻M^{v+}, COF, CO₂H, and CO₂⁻M^{v+}, wherein v is the valence of M and M is a cation selected from Group I, Ia, IIa, IIb, IIIa, IIIb, IVa, IVb, and transition elements.

2. (Amended) The golf ball of [any] claim 1 wherein said [outer surface] cover layer is comprised of about 100 wt% of said functionalized fluoropolymer.

3. (Amended) A golf ball having at least [an outer surface] a cover layer formed of a material selected from the group consisting of thermoplastic materials and thermosetting materials, wherein the improvement comprises applying upon said [outer surface at least one layer of] cover layer [a] at least one coating layer [material], said coating layer [material] comprising at least one functionalized fluoropolymer, wherein said fluoropolymer has the formula



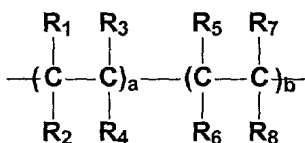
in which a is a number from 1 to 100, b is a number from 99 to 1, R₁-R₇ are independently selected from the group consisting of H, F, alkyl, and aryl; wherein at least one of R₁-R₇ is F; and R₈ is [H, F, or] a moiety of the formula



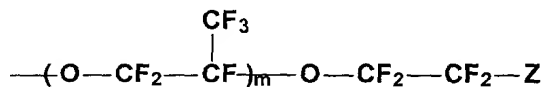
in which m is a number from 1 to 18; and Z is selected from the group consisting of SO₂F, SO₃H, SO₃⁻M^{v+}, COF, CO₂H, and CO₂⁻M^{v+}, wherein v is the valence of M and M is a cation selected from Group I, Ia, IIa, IIb, IIIa, IIIb, IVa, IVb, and transition elements.

4. (Amended) The golf ball of claim 3 wherein [said] at least one coating layer [material] is comprised of up to about 100 wt% of said functionalized fluoropolymer.

5. (Amended) A golf ball having [an outer surface] a cover layer, said golf ball having at least one coating layer deposited upon said [outer surface] cover layer, said [outer surface] cover layer formed of a material selected from the group consisting of thermoplastic materials and thermosetting materials, wherein at least said [outer surface] cover layer and [said] at least one coating layer comprise at least one functionalized fluoropolymer, wherein said fluoropolymer has the formula

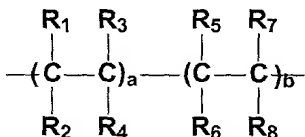


in which a is a number from 1 to 100; b is a number from 99 to 1; R_1 - R_7 are each selected from the group consisting of H, F, alkyl, and aryl; wherein at least one of R_1 - R_7 is F; and R_8 is a moiety of the formula

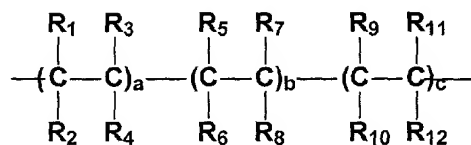


in which m is a number from 1 to 18; and Z is selected from the group consisting of SO_2F , SO_3H , SO_3M^{v+} , COF , CO_2H , and CO_2M^{v+} , wherein v is the valence of M and M is a cation selected from Group I, Ia, IIa, IIb, IIIa, IIIb, IVa, IVb, and transition elements.

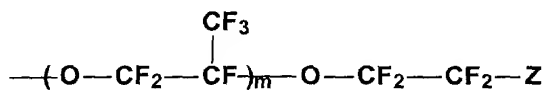
6. (Amended) A golf ball having a cover layer wherein the improvement comprises forming at least said cover layer of a thermoplastic material comprising at least one functionalized fluoropolymer, wherein said fluoropolymer has the formula [



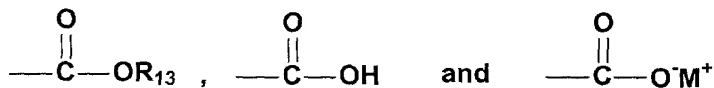
The golf ball of any of claims 1, 3 or 5 wherein said fluoropolymer is a terpolymer having the formula]



wherein a is a number from 1 to 100; b is a number from 99 to 1; c is a number from 1 to 50 ;
R₁-R₇ are each selected from the group consisting of H, F, alkyl, and aryl; wherein at least
one of R₁-R₇ is F; and R₈ is a moiety of the formula

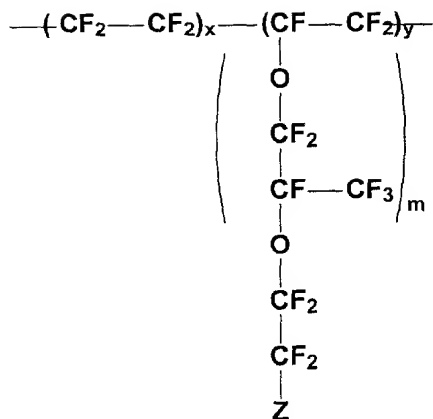


in which m is a number from 1 to 18; and Z is selected from the group consisting of SO₂F,
SO₃H, SO₃⁻M^{v+}, COF, CO₂H, and CO₂⁻M^{v+}, wherein v is the valence of and M is a cation
selected from Group I, Ia, IIa, IIb, IIIa, IIIb, IVa, IVb, and transition elements; R₉-R₁₁ are
independently selected from the group consisting of H, F, alkyl and aryl; and R₁₂ is selected
from the group consisting of



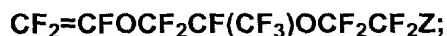
wherein R₁₃ is a C₁-C₁₂ linear or branched chain alkyl group.

7. (Amended) The golf ball of any claims 1, 3 or 5, wherein said fluoropolymer has the formula



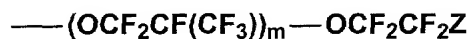
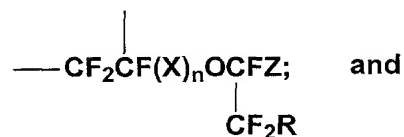
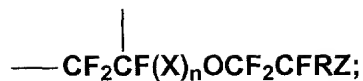
wherein m is 1-12; x is 1-100; y is 99 to 1; and Z is selected from the group consisting of SO₂F, SO₃H, SO₃⁻M^{v+}, COF, CO₂H, and CO₂⁻M^{v+}, wherein v is the valence of M and M is a cation selected from Group I, Ia, IIa, IIb, IIIa, IIIb, IVa, IVb, and transition elements.

9. (Amended) The golf ball of any one of claims 1, 3 or 5, wherein said fluoropolymer is formed by copolymerizing perfluoroethylene or a perfluoro-α-olefin with a vinyl ether having a structure selected from the group consisting of



wherein X is O(CF₂)₂₋₁₀, OCF₂CFY, or OCFYCF₂, with Y = F or CF₃; Z is selected from the group consisting of SO₂F, SO₃H, SO₃⁻M^{v+}, COF, CO₂H, and CO₂⁻M^{v+}, wherein v is the valance of M and M is a cation selected from Group I, Ia, IIa, IIb, IIIa, IIIb, IVa, IVb and transition elements; R is F or a perfluoroalkyl group having up to 10 carbon atoms; and n is 0, 11, or 2.

10. (Amended) The golf ball of any one of claims 1, 3 or 5 wherein said fluoropolymer has molecular units selected from the group consisting of



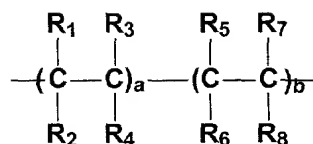
wherein X is O(CF₂)₂₋₁₀, OCF₂CFY or OCFYCF₂, with Y=F or CF₃; Z is selected from the group consisting of SO₂F, SO₃H, SO₃M^{v+}, COF, CO₂H and CO₂M^{v+}, wherein v is the valence of M and M is a cation selected [for the] from Group I, Ia, IIa, IIb, IIIa, IIIb, IVa, IVb and transition elements; R is F or a perfluoroalkyl group having up to 10 carbon atoms; n is 0, 1 or 2; and m is 7-10.

12. (Amended) The golf ball of claim 1 or 5 wherein said fluoropolymer comprises from about 10 to about 90% of at least said [outer surface] cover layer and wherein about 10% of said [outer surface] cover layer is comprised of one or more non-fluorinated thermoplastic polymers selected from the group consisting of ionomeric polymers, non-ionomeric polymers, and mixtures thereof.

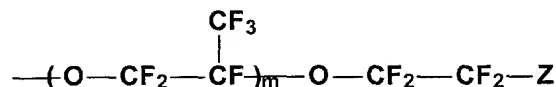
13. (Amended) The golf ball of claim 1 or 5 wherein said ball comprises at least one cover layer and a core[, and wherein said outer surface comprises said cover layer].

18. (Amended) A method of enhancing the cut and abrasion resistance of a golf ball comprising the steps of:

- a) forming a golf ball core; and
- b) forming a cover around said core by molding a cover stock material comprising a fluoropolymer about said core, wherein said fluoropolymer has the formula

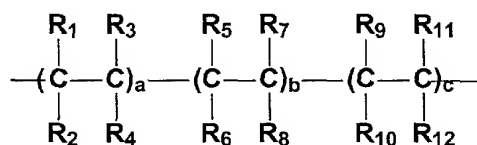


in which a is a number from 1 to 100; b is a number from 99 to 1; R₁-R₇ are independently selected from the group consisting of H, F, alkyl, and aryl; wherein at least one of R₁-R₇ is F; and R₈ is [H, F or] a moiety of the formula

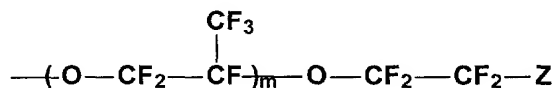


in which m is a number from 1 to 18; and Z is selected from the group consisting of SO₂F, SO₃H, SO₃^{M^{v+}}, COF, CO₂H, and CO₂^{M^{v+}}, wherein v is the valence of M and M is a cation selected from Group I, Ia, IIa, IIb, IIIa, IIIb, IVa, IVb, and transition elements.

19. (Amended) The method of claim 18 which further comprises choosing a cover stock material comprising a fluoropolymer, wherein said fluoropolymer is a terpolymer having the formula

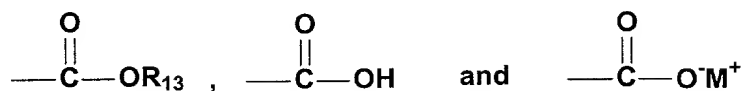


wherein a is a number from 1 to 100; b is a number from 99 to 1; c is a number [form] from 1 to 50; R₁-R₇ are each selected from the group consisting of H, F, alkyl, and aryl; wherein at least one of R₁-R₇ is F; and R₈ is a moiety of the formula



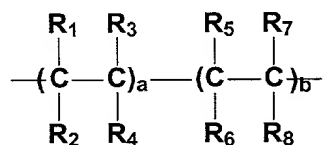
in which m is a number from 1 to 18; and Z is selected from the group consisting of SO₂F, SO₃H, SO₃^{M^{v+}}, COF, CO₂H, and CO₂^{M^{v+}}, wherein v is the valence of M and M is a cation selected from Group I, Ia, IIa, IIb, IIIa, IIIb, IVa, IVb, and transition elements; R₉-R₁₁ are

independently selected from the group consisting of H, F, alkyl and aryl; and R₁₂ is selected from the group consisting of

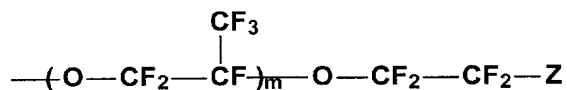


wherein R₁₃ is a C₁-C₁₂ linear or branched chain alkyl group.

22. (Amended) A method of enhancing the cut resistance, abrasion resistance, and durability of a golf ball which comprises forming a golf ball and applying to the golf ball a coating composition comprising a fluoropolymer, wherein said fluoropolymer has the formula

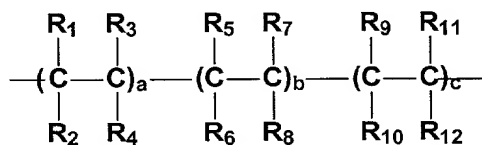


in which a is a number from 1 to 100; b is a number from 99 to 1; R₁-R₇ are independently selected from the group consisting of H, F, alkyl, and aryl; wherein at least one of R₁-R₇ is F; and R₈ is [H, F, or] a moiety of the formula

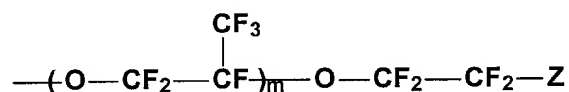


in which m is a number from 1 to 18[:]; and Z is selected from the group consisting of SO₂F, SO₃H, SO₃⁻M^{v+}, COF, CO₂H, and CO₂⁻M^{v+}, wherein v is the valence of M and M is a cation selected from Group I, Ia, IIa, IIb, IIIa, IIIb, IVa, IVb, and transition elements.

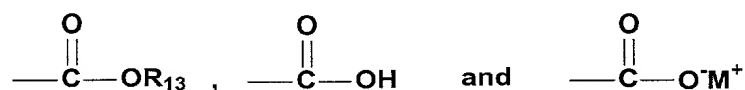
23. (Amended) The method of claim 22 which further comprises applying to said golf ball a coating composition comprising a fluoropolymer, wherein said fluoropolymer is a terpolymer having the formula



wherein a is a number from 1 to 100; b is a number from 99 to 1; c is a number [form] from 1 to 50; R₁-R₇ are each selected from the group consisting of H, F, alkyl, and aryl; wherein at least one of R₁-R₇ is F; and R₈ is a moiety of the formula



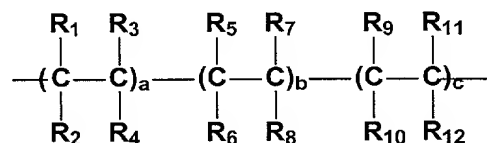
in which m is a number from 1 to 18; and Z is selected from the group consisting of SO₂F, SO₃H, SO₃M^{v+}, COF, CO₂H, and CO₂M^{v+}, wherein v is the valence of M and M is a cation selected from Group I, Ia, IIa, IIb, IIIa, IIIb, IVa, IVb, and transition elements; R₉-R₁₁ are independently selected from the group consisting of H, F, alkyl and aryl; and R₁₂ is selected from the group consisting of



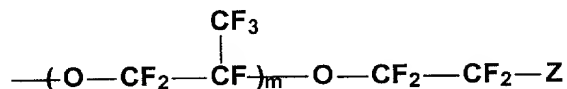
wherein R₁₃ is a C₁-C₁₂ linear or branched chain alkyl group.

24. (New) The golf ball of claim 1 wherein the golf ball has at least one coating layer over the cover layer.

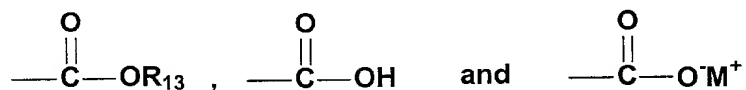
25. (New) A golf ball having at least a cover layer formed of a material selected from the group consisting of thermoplastic materials and thermosetting materials, wherein the improvement comprises applying upon said cover layer at least one coating layer, said coating layer comprising at least one functionalized fluoropolymer, wherein said fluoropolymer has the formula



wherein a is a number from 1 to 100; b is a number from 99 to 1; c is a number from 1 to 50 ;
 R_1 - R_7 are each selected from the group consisting of H, F, alkyl, and aryl; wherein at least
 one of R_1 - R_7 is F; and R_8 is a moiety of the formula

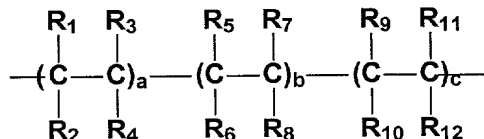


in which m is a number from 1 to 18; and Z is selected from the group consisting of SO_2F ,
 SO_3H , $SO_3^-M^{v+}$, COF , CO_2H , and $CO_2^-M^{v+}$, wherein v is the valence of and M is a cation
 selected from Group I, Ia, IIa, IIb, IIIa, IIIb, IVa, IVb, and transition elements; R_9 - R_{11} are
 independently selected from the group consisting of H, F, alkyl and aryl; and R_{12} is selected
 from the group consisting of

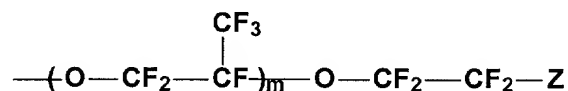


wherein R_{13} is a C_1 - C_{12} linear or branched chain alkyl group.

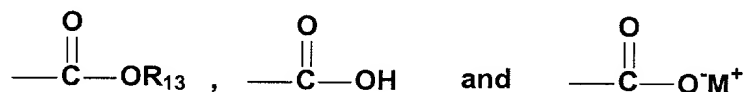
26. (New) A golf ball having a cover layer, said golf ball having at least
 one coating layer deposited upon said cover layer, said cover layer formed of a material
 selected from the group consisting of thermoplastic materials and thermosetting materials,
 wherein at least said cover layer and at least one coating layer comprise at least one
 functionalized fluoropolymer, wherein said fluoropolymer has the formula



wherein a is a number from 1 to 100; b is a number from 99 to 1; c is a number from 1 to 50 ;
 R_1 - R_7 are each selected from the group consisting of H, F, alkyl, and aryl; wherein at least
 one of R_1 - R_7 is F; and R_8 is a moiety of the formula



in which m is a number from 1 to 18; and Z is selected from the group consisting of SO_2F ,
 SO_3H , $\text{SO}_3^-\text{M}^{v+}$, COF , CO_2H , and $\text{CO}_2^-\text{M}^{v+}$, wherein v is the valence of and M is a cation
 selected from Group I, Ia, IIa, IIb, IIIa, IIIb, IVa, IVb, and transition elements; R_9 - R_{11} are
 independently selected from the group consisting of H, F, alkyl and aryl; and R_{12} is selected
 from the group consisting of



wherein R_{13} is a C_1 - C_{12} linear or branched chain alkyl group.

REMARKS

Claims 1 to 26 appear in the reissue application for the Examiner's review and consideration. Claims 1-7, 9, 10, 12, 13, 18, 19, 22 and 23 have been amended as described below. Claims 8, 11, 14-17, 20 and 21 are pending without any amendment. New claims 24-26 have been added. The amendments to the specification (described below) have been made to correct obvious misspellings and typographical errors; no new matter has been added by these changes. The claims, as amended, are fully supported by the specification and claims as originally filed and, therefore, there is no issue of new matter.

The word "form" has been replaced with from in claims 19 and 23, to correct typographical errors.

The words "for the" have been replaced with from in claim 10, to correct a typographical error.

The formula in claim 8 and at col. 7 1.1-14 of the specification has been amended to correct an obvious typographical error wherein CF₂ was shown as CF.

Claims 1-3, 5, and 12 have been amended to replace the words "outer surface" with cover layer. These amendments have been made to clarify the original language of the claims. Support for these amendments is found in claim 13 of U.S. Patent No. 5,691,066, as issued.

Claim 6 has been rewritten in independent form to remove the multiple dependency. Claim 6 as amended, along with new claims 25 and 26 recite that the fluoropolymer is a terpolymer. Support for this amendment and for new claims 25 and 26 may be found in col. 6, lines 46-55, and in claim 6 of U.S. Patent No. 5,691,066, as issued.

Claims 19 and 23 have been amended to recite that the fluoropolymer is a terpolymer. Support for these amendments is found in col. 6, lines 46-55. Further, claims 6, 19 and 23 have been amended to explicitly recite the composition of the fluoropolymer. Support for these amendments is found in col. 6, lines 24-55.

Claim 9 has been amended to correct an inadvertent oversight wherein the species with which the vinyl ether is copolymerized was omitted. Support for this amendment is found at col. 7, lines 34-35.

Claim 10 has been amended to correct an inadvertent oversight wherein the definition of Y was omitted. Support for this amendment is found at col. 7, lines 31-32.

New claim 24 has been added to more particularly point out and distinctly claim the subject matter of the invention. No new matter is added by this new claim. Support for this claim is found at col. 4, lines 46-57.

Depending on the exact interpretation of the preamble to independent claims 1, 3, 5, 18 and 22 of U.S. Patent No. 5,691,066, as issued, it may be possible to obtain a fluoropolymer which does not necessarily contain fluorine or a fluorinated moiety. To avoid errors of interpretation, applicant has amended the claims of the issued patent, as indicated above, to more specifically point out and distinctly claim the fluoropolymer of the invention.

Applicants submit that this reissue application is in condition for allowance, early notice of which would be appreciated. Should the Examiner not agree with the Applicants' position, then a personal or telephonic interview is respectfully requested to discuss any remaining issues and expedite the eventual allowance of the reissue application.

No fee, other than that for the reissue application, is believed to be due for the present submission. However, if a fee is due, please charge the required amount to Pennie & Edmonds LLP Deposit Account No. 11-650.

Respectfully submitted,

Date April 6, 2001

James G. Markey / by Ian Sack Reg No 44,327
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James G. Markey (Reg. No.)

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